

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on June 25, 2003, and the references cited therewith. No claims are amended; no additional claims are canceled, and claims 36-43 are added; as a result, claims 22-24, 27-32 and 36-43 are now pending in this application.

Applicant's Attorney, Barbara J. Clark, acknowledges two telephone interviews with the Examiner on August 11, 2003 and August 13, 2003. During the interviews, Applicant's Attorney sought clarification on the withdrawal of claims 1-3, 5-9, 25-26 and 33-35 in the current Office Action. The Examiner stated that these claims were withdrawn due to the addition of the phrase "at least two clips" in the Amendment and Response filed on April 24, 2003, as this element is shown in FIG. 8, which illustrates a species related to withdrawn claims 13-21. The Examiner and Ms. Clark also discussed possible approaches for obtaining allowable claims, although no agreement was reached. Ms Clark thanks the Examiner for the courtesies extended during these interviews.

Regarding the newly withdrawn claims, Applicant asserts the right to reintroduce these claims in an appropriately filed continuing or divisional application. Furthermore, upon allowance of a generic claim, Applicant is entitled to consideration of claims to additional species written in dependent form or which otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141.

The new claims have support throughout the specification. No new matter has been added as a result. Applicant respectfully requests reconsideration of the above-identified application in view of the amendments above and the remarks that follow.

Drawings

The drawings were rejected under 37 CFR 1.83(a). FIG. 2 has now been amended to show the fan 115 attached to the front of the heat sink 100.

Reconsideration and withdrawal of this objection is respectfully requested.

§103 Rejection of the Claims

Claims 22-24 and 27

Claims 22-24 and 27 were rejected under 35 USC § 103(a) as being unpatentable over Jean (U.S. 5,701,951) or Morosas (U.S. 5,494,098) in view of Lee (U.S. 5,375,655) and Wyler et al. (U.S. 6,401,807).

The Office Action states that the patent of Jean and Morosas disclose all the claimed features with the exception of a clip, the claimed aspect ratio and the folded fin having arches. The Office Action also states that Lee discloses it is known to have a folded fin having semi-circular arches and an aspect ratio within the claimed range for the purposes of reducing pressure losses within the fluid flowing over the arches and that it would have been obvious to employ in Jean or Morosas semi-circular arches and an aspect ratio within the claimed range for the purpose of reducing pressure losses within the fluid flowing over the arches as disclosed in Lee. The Office Action further states that it would have been obvious to have the claimed materials. The Office Action also states that Wyler, in at least FIG. 12, discloses that it is known to have a clip which couples physically and thermally a heat sink/fins to a base for the purpose of providing a secure and elastic connection between the heat sink and base and that it would have been obvious to employ in Jean or Morosas as modified, a clip which couples physically and thermally the heat sink/fins to the base for the purposes of obtaining a secure and elastic connection between the heat sink and base as disclosed in Wyler.

Applicant respectfully submits that the Office Action has not established the *prima facie* obviousness of the present claims. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Applicant further notes that claims 23-24 and 27 are dependent claims. The additional limitations provided in dependent claims cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is determined to be nonobvious.

Neither Jean nor Morosas teach or suggest the claimed invention. Jean discusses a heat dissipation device having a corrugated porous heat dissipating plate fixed on the upper surface of a base plate to transfer heat from the base plate to the heat dissipating plate. The heat dissipating plate consists of several generally V-shaped sections. (See col. 2, lines 40-43). Morosas discusses a plurality of spaced cooling fins required to be fixed not only to a base, but also to a top wall of a housing that has an aperture aligned with an outlet opening of the fan assembly. Airflow from the fan assembly extends from the opening in the top wall of the housing and out through both end openings of the housing. And, as the Examiner admits, neither Jean nor Morosas discuss a folded fin having semi-circular arches nor a clip.

Neither Lee nor Wyler overcome the deficiencies of the primary references. Lee discusses a heat sink apparatus that utilizes either natural or forced convection to transfer heat. The fin elements can take on a variety of configurations, including V- or saw tooth-shaped, segmented in design (i.e., modified conventional fin shown in FIG. 4), and the like. Applicant could find no discussion in Lee of any embodiments that include providing openings in the fin elements. Rather, the focus in Lee appears to be on boundary layer fluid flow patterns (Col. 3, lines 32-33 and col. 6, lines 53-65). In many embodiments there is also a cover plate on top of the fin bundle. Wyler discusses a heat sink assembly having a complex spring clamp 121 which extends under the entire length of the fin structure and includes a series of flexible linkages for pressing a trough against the base plate. (See also FIG. 13 and col. 9, line 18 through col. 10, line 38).

In contrast, claim 22 recites a heat sink, comprising a thermally conductive sheet creased in an accordion fold to form a plurality of surfaces defining a fin bundle having a top and a bottom, each fin having an aspect ratio of between about 20:1 and 30:1, wherein the top of the fin bundle is modified to create a plurality of trimmed openings that extend along a portion of the length of the top of the fin bundle, wherein the top of the fin bundle comprises a plurality of arches, and the trimmed openings are formed by removing the plurality of arches along the portion of the length of the top, wherein more than fifty percent of the plurality of surfaces are

Jean
is relied upon
to teach
openings in
the fins.

receptive to an introduced convection medium; a fan for introducing the convection medium, the fan attached to the top of the fin bundle; a base attached to the bottom of the fin bundle; and a clip to attach and thermally couple the base to the bottom of the fin bundle, the clip not in contact with the top of the fin bundle when in place.

Clearly, the products in the primary references and each of the products in the secondary references are all fundamentally different from each other and such critical differences must be recognized. In re Bond, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990), *reh'g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990).

The Office Action relies on In re Keller and In re Merck & Co. to argue that one cannot show nonobviousness by attacking references individually where the rejections are based on a combination of references. Applicant respectfully submits that it was the inappropriateness of the combination of references that was (and is) being attacked, which necessarily requires comments on the individual references that comprise the combination. Additionally, these holdings do not relieve the PTO of the obligation of setting forth a *prima facie* case of obviousness. As noted above, this includes the requirement to show that there is a suggestion or motivation, either in the cited references themselves or in the knowledge generally available to an art worker, to modify the reference or to combine reference teachings so as to arrive at the claimed invention.

In order to comply with this requirement, the Office Action must provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding. In re Sang Su Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). Instead, the Office Action stated, "it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Jean or Morosas semi-circular arches and an aspect ratio within the claimed range for the purpose of reducing pressure losses within the fluid flowing over the arches as disclosed in Lee." The Office Action also stated, "it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Jean or Morosas as modified, a clip which couples physically and thermally the heat sink/fins to the base for the purpose of obtaining a secure and elastic connection between the heat sink and the base as disclosed in Wyler." These are mere conclusory statements of subjective belief.

Conclusory statements do not adequately address the issue of motivation to combine. In re Sang Su Lee, supra. It further appears that the Office Action has impermissibly used the current invention as a roadmap to identify the purpose leading one to make the combination. Although the Office Action, in its reliance on In re McLaughlin, recognizes that only the knowledge which was within the level of ordinary skill at the time the claimed invention was made can be used, there is no objective evidence to show that this is what has been done. Applicant respectfully requests such objective evidence be provided or the rejection be withdrawn.

The references neither independently, or combined, contain each and every element of Applicant's claimed invention. Applicant respectfully submits that independent claim 22, and claims 23-24 and 27, which depend from claim 22, are patentably distinct from the cited references, either alone or in combination. Claims 22-24 and 27, each viewed as a whole, are not suggested by the cited references and not obvious under 35 USC § 103(a). Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 28-31

Claims 28-31 were rejected under 35 USC § 103(a) as being unpatentable over Jean or Morosas in view of Lee and Bishop et al. (U.S. 5,576,932).

The Office Action restates all of the above comments regarding Jean, Morosas and Lee. The Office Action further states that Bishop in FIG. 1 discloses that it is known to have first and second fans for the purpose of enhancing convective heat transfer and that it would have been obvious to employ in Jean or Morosas as modified, a second fan for the purpose of enhancing the convective heat transfer of the heat sink as disclosed in Bishop.

Applicant again respectfully submits that the Examiner has not established the *prima facie* obviousness of the present claims.

Furthermore, claims 29-31 are dependent claims. The additional limitations provided in dependent claims cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is determined to be nonobvious.

Neither Jean nor Morosas teach or suggest the claimed invention, including the desirability to use more than one fan, for all the reasons stated above. Applicant also notes that Morosas appears to teach away from the use of multiple fans given the comments contained in

Bishop et al.
teaches the
use of
more than
one fan

the Background regarding the problems with the use of multiple fans with a general forced convection system (col. 1, lines 23-27). Additionally, Lee does not overcome the deficiencies of Jean or Morosas for all of the reasons stated above. Bishop also does not overcome the deficiencies of either Jean or Morosas. Bishop discusses a method and apparatus for cooling a heat source using a base that includes flanges referred to as "rectangular-shaped fins," such flanges in contact on their top surfaces with a plate 16 having openings 28. (See col. 4, lines 8-16). As with Lee, Applicant can not find any discussion in Bishop of any embodiments that included providing openings in the fins.

In contrast, claim 28 recites a heat sink, comprising a thermally conductive sheet creased in an accordion fold to form a plurality of surfaces defining a fin bundle having a top and a bottom, each fin having an aspect ratio of between about 20:1 and 30:1, wherein the top of the fin bundle is modified to create a plurality of trimmed openings that extend along a portion of the length of the top of the fin bundle, wherein the top of the fin bundle comprises a plurality of arches, and the trimmed openings are formed by removing the plurality of arches along the portion of the length of the top, wherein more than fifty percent of the plurality of surfaces are receptive to an introduced convection medium; a first fan for introducing the convection medium in a first direction, the fan attached to the top of the fin bundle; a second fan for introducing the convection medium in a second direction, the second fan attached to the front of the folded fin structure; and a base attached to the bottom of the fin bundle.

Again, the products in the primary references and the products in the secondary references are fundamentally all different from one other and such critical differences must be recognized. In re Bond, supra.

However, as noted above, Bishop does share a unique feature in common with Lee, namely, the absence of any openings in the fins, which demonstrates a lack of appreciation of the inherent benefit provided by such openings (i.e., increased surface area for cooling). Such a fin structure teaches away from the claimed invention. Applicant notes that while a court must ascertain the differences between a claimed invention and the prior art, it is not proper to focus on the question of whether any particular difference or differences would have been obvious. Rather, 35 USC 103 requires that the invention be considered "as a whole." Furthermore, a prior art reference must be considered in its entirety, including portions that teach away from the

claimed invention. The fact that a reference teaches away from a claimed invention is highly probative that the reference would not have rendered the claimed invention obvious to one of ordinary skill in the art. Stranco Inc. v. Atlantes Chemical Systems, Inc., 15 USPQ2d 1704, 1713 (Tex. 1990).

Applicant again acknowledges the teachings of In re Keller and In re Merck & Co. but again submits that it is the inappropriateness of the combination of references that is being attacked, which necessarily requires comments on the individual references that comprise the combination. In any case, these holdings do not relieve the PTO of the obligation of setting forth a *prima facie* case of obviousness.

To meet its burden, the Office Action must provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding. In re Sang Su Lee, *supra*. Instead, the Office Action stated, "it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Jean or Morosas as modified, a second fan for the purpose of enhancing the convective heat transfer of the heat sink as disclosed in Bishop et al." This is again a mere conclusory statement of subjective belief. Conclusory statements do not adequately address the issue of motivation to combine. In re Sang Su Lee, *supra*. It further appears that the Office Action has impermissibly used the current invention as a roadmap to identify the purpose leading one to make the combination. Although the Office Action, in its reliance on In re McLaughlin, recognizes that only the knowledge which was within the level of ordinary skill at the time the claimed invention was made can be used, there is no objective evidence to show that this is what has been done. Applicant respectfully requests such objective evidence be provided or the rejection be withdrawn.

The references neither independently, or combined, contain each and every element of Applicant's claimed invention. Applicant respectfully submits that independent claim 28 and claims 29-31 which depend from claim 28, are patentably distinct from the cited references, either alone or in combination. Claims 28-31, viewed as a whole, are not suggested by the cited references and are not obvious under 35 USC § 103(a). Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 32

Claim 32 was rejected under 35 USC § 103(a) as being unpatentable over Jean or Morosas in view of Lee and Bishop et al. and in further view of Yeh (U.S. 5,706,169) or Wyler et al..

The Office Action states that the device of Jean or Morosas as modified fail to teach a second fan and/or the fan attached to the front, but that Yeh discloses that it is known to have a clip which couples a heat sink/fins physically and thermally to a base and that it would have been obvious to employ in Jean or Morosas as modified, a clip which couples the heat sink/fins physically and thermally

Applicant again respectfully submits that the Examiner has not established the *prima facie* obviousness of the present claims.

Furthermore, claim 32 is a dependent claim. The additional limitations provided in dependent claim 32 cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is determined to be nonobvious.

Neither Jean nor Morosas teach or suggest the claimed invention for all of the reasons stated above. Neither Lee nor Bishop overcome the deficiencies of the primary references for all of the reasons stated above. Wyler also does not overcome the deficiencies of the primary and secondary references for all of the reasons stated above. Yeh also does not overcome the deficiencies of the primary and secondary references. Yeh discusses a single fastening "frame" having two vertical arms and a horizontal arm. The horizontal arm of the single fastening frame is necessarily in contact with the top of the cooling fin as shown in FIGS. 1 and 2. (See also col. 3, lines 17-30).

In contrast, claim 32 teaches the heat sink of claim 28 in combination with at least one clip to attach and thermally couple the base to the bottom of the fin bundle.

Again, the products in the primary references and the products in the secondary references are fundamentally all different from one other and such critical differences must be recognized. In re Bond, *supra*.

The Office Action has again failed to meet its burden of providing specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and has failed to explain the reasoning by which the evidence is deemed to support such a

finding. In re Sang Su Lee, supra. Instead, the Office Action stated, "it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Jean or Morosas as modified, a clip which couples physically and thermally the heat sink/fins to the base for the purpose of obtaining a secure and elastic connection between the heat sink and the base as disclosed in Yeh and Wyler et al." This is again a mere conclusory statement of subjective belief. Conclusory statements do not adequately address the issue of motivation to combine. In re Sang Su Lee, supra. It further appears that the Office Action has impermissibly used the current invention as a roadmap to identify the purpose leading one to make the combination. Although the Office Action, in its reliance on In re McLaughlin, recognizes that only the knowledge which was within the level of ordinary skill at the time the claimed invention was made can be used, there is no objective evidence to show that this is what has been done. Applicant respectfully requests such objective evidence be provided or the rejection be withdrawn.

The references neither independently, or combined, contain each and every element of Applicant's claimed invention. Applicant respectfully submits that independent claim 28 and claim 32 which depends from claim 28, are patentably distinct from the cited references, either alone or in combination. Claim 32 viewed as a whole, is not suggested by the cited references and are not obvious under 35 USC § 103(a). Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney, Barbara Clark at (515) 233-3865, or the below signed attorney to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date Aug. 25, 2003

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 25 day of August, 2003.

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